CLAIMS

1. An apparatus for generating an acoustic signal comprising:

a dielectric substrate having opposed first and second opposed surfaces,

a pair of electrodes mounted on said first surface of said substrate so that said electrodes are spaced apart from each other,

a high voltage power source electrically connected to said electrodes to produce a high voltage electric potential between said electrodes, said high voltage electric potential being below a level sufficient to create a surface arc discharge along said first surface of said dielectric substrate,

an electrical conductor strip mounted to said second side of said substrate, and

means for initiating a surface arc discharge along said first surface of said dielectric between said electrodes.

2. The invention as defined in claim 1 wherein said initiating means comprises a trigger circuit having a voltage output signal electrically connected to said conductor strip.

3. The invention as defined in claim 2 wherein said trigger voltage signal comprises a sinusoidal waveform.

4. The invention as defined in claim 1 wherein said substrate is planar.

5. The invention as defined in claim 1 wherein said substrate is formed to have an opening aligned with and spaced from said electrodes.

6. The invention as defined in claim 1 wherein said substrate is shaped to direct sound in a predetermined direction.

7. The invention as defined in claim 6 wherein said substrate is in the shape of a parabola.

8. The invention as defined in claim 1 wherein said substrate comprises alumina.

9. The invention as defined in claim 1 wherein each electrode has a rounded nose, said rounded noses of said electrodes facing each other.

10. The invention as defined in claim 1 and comprising at least one corona discharge point positioned above said first surface of said dielectric between said electrodes.

11. The invention as defined in claim 10 and comprising a plurality of corona discharge points positioned above said first surface of said dielectric between said electrodes.

12. The invention as defined in claim 1 wherein said initiating means comprises means for varying the electric field along said first surface of said dielectric.

13. An apparatus for generating an acoustic signal comprising:

a dielectric substrate having opposed first and second opposed surfaces,

a pair of electrodes mounted on said first surface of said substrate so that said electrodes are spaced apart from each other, said first surface of said electrode being positioned in an ambient gas,

a high voltage power source electrically connected to said electrodes to produce a high voltage electric potential between said electrodes, said high voltage electric potential

being below a level sufficient to create a surface arc discharge along said first surface of said dielectric substrate,

an electrical conductor strip mounted to said second side of said substrate, and

means for varying the electric field adjacent at least one of said electrodes by an amount sufficient to ionize the gas at said at least one electrode to thereby initiate a surface arc discharge along said first surface of said dielectric between said electrodes.

14. The invention as defined in claim 13 wherein said electric field varying means comprises a trigger circuit having a voltage output signal electrically connected to said conductor strip.

15. An apparatus for generating an acoustic signal comprising:

a dielectric substrate having opposed first and second opposed surfaces,

a pair of electrodes mounted on said first surface of said substrate so that said electrodes are spaced apart from each other, said first surface of said dielectric being disposed in a gas,

a high voltage power source electrically connected to said electrodes to produce a high voltage electric potential between said electrodes, said high voltage electric potential

being below a level sufficient to create a surface arc discharge along said first surface of said dielectric substrate,

an electrical conductor strip mounted to said second side of said substrate, and

a trigger circuit having a voltage output signal electrically connected to said conductor strip, said trigger voltage output signal having a voltage magnitude sufficient to ionize the gas adjacent at least one of said electrodes thereby initiating a surface arc discharge between said electrodes.

16. The invention as defined in claim 15 and comprising at least one corona discharge point positioned above said first surface of said dielectric between said electrodes.

17. The invention as defined in claim 16 and comprising a plurality of corona discharge points positioned above said first surface of said dielectric between said electrodes.